CALIFORNIA WATER PLAN
UPDATE 2013
GROUNDWATER CAUCUS
NOVEMBER 10, 2011

TOPICS FOR DISCUSSION

California Water Plan Update 2013 Groundwater Caucus

November 10, 2011

Deliverable 1: Compile groundwater information

We are compiling groundwater related information from existing State, Federal, and Local planning activities. These include:

- Groundwater management plans,
- CASGEM monitoring plans,
- IRWM plans,
- Local planning studies,
- Tribal Groups planning studies,
- Urban water management plans,
- Agricultural water management plans,
- Water transfer related data and information, and
- Groundwater modeling reports.

Deliverable 2: Summarize groundwater conditions and management activity

We are trying to provide summary information on the following:

- Brief physical description of aquifer systems, building on Bulletin 118-2003.
- General overview and status of regional aquifer conditions:
  - Report existing regional groundwater budget numbers (by County, basin, ?) when available.
  - Identify and develop key local (County, basin, ?) groundwater hydrographs.
  - Develop regional dot maps for dry versus normal year.
  - Describe aquifer historic response to normal vs. dry year demand.
  - Provide overview of existing groundwater problems (quantity, quality – salinization and/or salinity intrusion, and subsidence,)
- General overview and status of groundwater management activities: Groundwater management plans, groundwater ordinances, groundwater level monitoring programs, groundwater quality monitoring programs, subsidence monitoring programs, active recharge projects, activity in drought water bank programs, etc.

Topics for Discussion

1. How do we resolve overlapping management plan boundaries and data gaps?
2. Does the report organization seem workable?
3. Content development…how can you or your staff help contribute?

Deliverable #2: Summarizing groundwater conditions and management activities

May 19/2011 Groundwater Caucus Topics for Discussion

Policy/Guidance Related:

1. What other information related to groundwater data and management would you like to see considered and compiled?
2. What in your view are some of the options to organize and disseminate the compiled information?
3. What in your view are some of the options to organize, synthesize, and report the groundwater content developed?

Topics for Future Caucus:

4. What other content related to groundwater would you like to see developed going forward in the next Water Plan Update (2018)?

Informational:

1. Can you provide contact information (name, organization, email, and telephone number) of persons who may be able to facilitate the Work Team's compilation of information planned for the deliverable as listed above?
2. To the best of your knowledge, what other information related to groundwater data and management are available and what is the contact information (name, organization, email, and telephone number) of persons who can provide that information to the Work Team?
3. Are you or your staff willing to participate in developing the groundwater content? Please provide contact information (name, organization, email, and telephone number).
4. Can you recommend local, regional, State, and federal agencies resource persons who may be willing to participate in developing the groundwater content? What is the contact information (name, organization, email, and telephone number)?

May 19/2011 Groundwater Caucus Feedback

Options to organize = things to consider

1. Basin and sub-basin–based
2. Other political boundary based
3. Aquifer-based
4. Physical versus political boundaries
5. Type of sw-gw interface
6. Watershed and subwatershed boundaries relative to basin boundaries
7. "Groundwater-shed"
8. Consider scalability
9. Terminology – define - use same language
10. Water supply sources (imported versus area of origin, and surface water versus groundwater)
11. Seasonality of dependence on groundwater
12. Management institutions
13. Management Plans
14. Conjunctive use and management
15. Existing and planned projects (conservation, recycled water, recharge)

16. Susceptibility to subsidence
17. Quality challenges (especially nitrate and salt)
18. State Agency data collection and management integration (GAMA, DWR, DPH, USGS etc)
19. Recharge mapping and permeability management
20. LID practices in groundwater-shed
21. Basin or bedrock

Synthesize

1. State Agency data collection and management integration (GAMA, DWR, DPH, USGS etc)
2. Identify key well hydrographs for seasonal and long-term trends
3. Identify key water quality hydrographs for seasonal and long-term trends
4. Use GAMA data program
5. Integrate surface water and groundwater data collection and management
6. Groundwater storage change
7. Groundwater budget

Report

1. Google/Wiki/Interactive GIS Internet web portal
2. Water Plan

Deliverable 4: Estimate annual change in groundwater storage

We intend to estimate change in groundwater storage for sufficiently characterized basins; and provide recommendations for basins where further data characterization is required before such calculation is appropriate. Over the last several years, DWR has been developing GIS based methodologies to estimate basin wide or sub-basin wide change in annual groundwater storage based on DWR's Water Data Library. The method consists of reading the water level data from Water Level Library, computing the change in water level for the basin, and then using this information with aquifer geometry data and aquifer properties to estimate the change in storage. We are documenting these procedures in a Technical memorandum scheduled to be released by July 2011. We are anticipating that the fully automated procedure in a multi-user environment will be completed by December 2011. The objective of developing this procedure is to provide more reliable estimates of groundwater change in storage, and to enhance the repeatability and reliability of these estimates.

The developed procedure will be used to quantify and report 2006 - 2010 change in groundwater storage by planning area/groundwater basin and will involve the following:

- Compile annual spring groundwater level data from 2006 through 2010.
- Calculate annual spring-to-spring change in groundwater level from 2006-2010.
- Calculate annual spring-to-spring change in groundwater storage from 2006-2010.
- Describe and illustrate change in storage information.

Topics for Discussion

1. Data availability - How should real and perceived data gaps be addressed?
2. Validation of results - What are your suggestions for confirming that the estimates are correct?
3. Local and Regional models - What are your suggestions for using local and regional GW models and other GW reports to supplement these estimates?

Deliverable #4: Estimate annual change in groundwater storage

May 19/2011 Groundwater Caucus Topics for Discussion

Policy/Guidance Related:

1. How would you like to see the change in groundwater storage information presented?
2. In addition to change in groundwater storage, what other information related to groundwater storage would you like to see developed?
3. Provide feedback on terms related to groundwater storage.

Informational:

1. To the best of your knowledge, are there any technical studies conducted and analytical methods developed for calculating change in groundwater storage computations? What are the reference study names and the contact information (name, organization, email, and telephone number)?
2. Are you or your staff willing to review the above mentioned Technical Memorandum documenting change in groundwater storage procedure and provide us feedback to improve the procedure? Please provide contact information (name, organization, email, and telephone number).
3. Can you recommend local, regional, State, and federal agencies resource persons who may be willing to review the above mentioned Technical Memorandum and provide us feedback to improve the procedure? What is the contact information (name, organization, email, and telephone number)?

May 19/2011 Groundwater Caucus Feedback

1- How would you like the change in groundwater storage information be presented?

We think that the groundwater storage information should be developed at the sub-basins level. The actual presentation of the change in storage can be at the IRWM regional level or the hydrologic regions. Providing information at the regional level will most likely be of much more use to the DWR regional partners. On the other hand, regional representation may sometimes conflict with the local and regional data/model/information that may be available from the regional partners. The scale of presentation of the results needs to be evaluated very carefully.
Time scale of the change in storage calculation needs to be evaluated. While a 5 year time scale may be efficient from data analysis stand point, it may not be long enough to provide long-term trends, thus not sufficient to guide policy decisions.

2- In addition to change in groundwater storage, what other information related to groundwater storage would you like to see developed?

Ideally, water budget information reflecting the same period as the change in GW storage would be provided. In the absence of that information, to the extent possible, time trend of certain water budget information such as pumping, recharge, or stream gains/losses would be useful, so that the change in storage results are placed in a better context with respect to the basin operation.

In addition, information on groundwater quality is critical. Often times, in coastal aquifers, the change in groundwater storage may show very little change, due to the sea level conditions. However, in reality, the areas that have zero change in groundwater storage may actually be intruded by saline water. Therefore, information on the quality of groundwater with certain indicators may shed light on the usability of the available GW in storage.

Information on vacant storage available without causing adverse impacts would be useful to the operators of the basin. This information can help plan for potential recharge opportunities at the regional level and/or state level.

Since all data used may not be of same quality, some indication of what the data accuracy is or the level of confidence in analysis would be helpful. This can be presented using certain color schemes/coding, or with designating certain confidence range, such as A, B, C; with A having reasonable confidence (when the data may have been checked against local/regional data), and C, having the least accuracy or confidence.

3- **Provide feedback on terms related to groundwater storage.**
We did not get time to discuss this in detail.

Deliverable 6: Inventory and describe potential for conjunctive management of groundwater and other supplies

We intend to inventory and describe the potential and constraints for conjunctive management and multi-benefit projects:

- Identify the potential groundwater storage capacity (available aquifer space).
- Identify the availability of water for managed in-lieu or active recharge.
- Identify constraints: legal and institutional, infrastructure, water quality, environmental, general cost vs. benefit, etc.

Topics for Discussion

Policy/Guidance Related:

1. As part of this deliverable, what are some of the critical information you would like to see compiled?
2. What are some of the red flags you see that we need to be aware of as we develop this deliverable?
3. Based on your knowledge and experience and given the general sensitivity related to this issue and the significant prevailing institutional, regulatory, infrastructural, and other constraints, what in your view would be the most effective way to develop and present this deliverable?

Informational:

1. Are you aware of any studies/reports that have developed inventories of conjunctive management projects with project description, annual yield, cost, etc.? What are the reference study names and the contact information (name, organization, email, and telephone number)?
2. Are you or your staff willing to participate in developing the content for this deliverable? Please provide contact information (name, organization, email, and telephone number).
3. Can you recommend local, regional, State, and federal agencies resource persons who may be willing to participate in developing the content for this deliverable? What is the contact information (name, organization, email, and telephone number)?